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Alfalfa Leafcutting Bee Newsletter: Volume I, No. 3

INTEGRATED PEST MANAGEMENT
AND INSECT PESTS OF ALFALFA SEED

Pest management in alfalfa seed differs from most other crops in one important aspect: an effective pest control program must be coordinated with an effective pollinator program before the seed grower can be successful.

Thirty years ago many fieldmen and seed growers in the Northwest were convinced they needed parathion to kill lygus bugs and pea aphids. As a result of bee poisoning problems, in 1953 research showed Demeton (Systox) to be very effective against pea aphids while doing little damage to pollinators. Demeton has continued to be the first choice aphicide since it is relatively safe to most aphid predators such as lady beetles and green lacewings.

Trichlorfon (Dylox) was first tested for lygus bug control in 1962. The material proved to be uniquely safe to leafcutting

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bees if applied properly. In addition, lygus bug predators, the western bigeyed bug and the western damsel bug were initially tolerant to trichlorfon. Acidification of alkaline spray water and the use of relatively cool spray water have improved the effectiveness of this material (Johansen, et.al, 1979).

The foundation of an effective pest management program is a weekly field survey beginning in May to initially detect alfalfa weevil activity and assist in timing pre-bloom applications if necessary. Survey techniques should remain consistent with techniques used in other states. Each field should be monitored at least once a week and more frequently if problems develop. A minimum of 5 sample sites in a 50 acre field is recommended with the "scout" returning to these same sites throughout the growing season. Sampling for most insects in alfalfa seed may be conducted by taking 5 straight sweeps, each consisting of a 6 foot swath at least 8 inches deep with a 15 inch diameter sweep net. One should take at least 2 steps between each sweep. Sample sites should be evenly distributed throughout the field, located on each edge and in the center. Edge locations should be at least 75 feet into the field to avoid an edge effect. Faster insects such as lygus bug adults are counted first and slower types (alfalfa weevils and aphids) are counted last. Lygus should be smashed or flicked out of the net to avoid counting them twice. If numbers of one insect species are too high to count after a 5 sweep sample, take an additional one-sweep sample to estimate numbers. FIRST, however, count all other insects in the five-sweep sample; then dump the net and take a one-sweep

sample and multiply by 5 to get the correct estimate. REMEMBER, a one-sweep sample is not accurate unless there are large numbers (50 or more) of an insect in the net. Be sure to note the field and sample location for each count (see sweep sample data sheet).

The sweep net will not be effective for certain insects and mites. Mites are rarely a problem in alfalfa seed in Montana. The Spotted alfalfa aphid may be occurring in many areas of Montana. It is easily confused with the yellow clover aphid and identification and distribution of the two in Montana has not been established. The spotted alfalfa aphid is smaller than other aphids found on alfalfa. It is pale yellow or grayish in color. There are four to six conspicuous rows of dark spots with a spine emerging from each spot which can be seen through a 10x lens. The spotted alfalfa aphid is found most commonly on the lower side of the leaves on the lower portions of the stems close to the ground. In large numbers large amounts of honeydew are often produced which will support the growth of a black sooty mold that will cover the leaves and lower portions of the stem. When the aphid feeds it introduces a toxin which kills the leaves, causing them to drop and fall from the plant.

Evaluation of spotted alfalfa aphid populations can be made by cutting stems with a sharp knife, gently lifting the stem out of the foliage and counting the aphids on the stem and underside of the leaves (Jensen, 1981). Treatment should not even be considered unless populations average 20-30 aphids per stem. Treatments for spotted alfalfa aphids have occurred this year in southeastern Montana.

Obviously, no set number of pest insects per sweep can be used to determine control measures. Factors such as types, number and vigor of pollinators, time of season, condition of field and presence of secondary pests must be considered before a reasonable decision can be made. In May and early June if there are 20-30 alfalfa weevil larvae per sweep, a suitable treatment should be made early to minimize killing of beneficial pollinators and predators. If selective materials are applied early in the season, they should be timed to control the first generation lygus bug nymphs while they are still in the vulnerable first, second and third stages. Early season sprays are more often than not necessary in integrated programs to remove the lag time for both the movement into fields and reproduction of predators as well as to minimize damage from pests.


Decisions to treat after mid-July depend upon predator populations. Any significant lygus bug hatches which occur before mid-July are likely to require control if bigeyed bugs and damsel bugs are not numerous yet. Lygus bug populations are unlikely to cause significant damage if the predator to lygus ratio is 2:1 or greater. From July 15 to the end of the season, large nymph and adult lygus bugs must average at least three per sweep before seed damage justifies the cost of pesticide application.

If the predator to lygus ratio is below 2:1, the field must be checked again within 3 days to assess the population. If the majority of lygus bug nymphs are reaching the 4th and 5th instar,

predators are not adequately controlling the population. Lygus bugs should not be chemically controlled after August 15, since seed damaged after this point will not have time to mature prior to harvest. Growers must have adequate pollinators because predator populations build faster in fields which are drying with a good seed set. Lygus bug populations decline under these conditions.

In summary, keys to a successful integrated control program are: (1) adequate pollinators, (2) good field sampling, (3) early pest control, (4) use of selective insecticides, (5) proper water management and (6) no insecticide applications once predator populations are established. (Johansen, 1981).

There are a limited number of growers with grasshopper problems in fields with established bee flights this year. Grasshoppers are usually controlled prior to bee flight by an application of furadan or cygon or other material with a relatively long residual life prior to June 15. If grasshoppers are migrating in, a boundary spray is recommended. If they are hatching out in the field, a field application is warranted or a combination of both may be used. If potential plant damage after bees are out warrants a necessary control, materials with short residual times and toxicity to grasshoppers may be considered. It may not be necessary to relocate bees. However, factors such as type of formulation, weather, rates, size of grasshoppers and timing of application all play a role in effectiveness of control and bee toxicity. The best insurance is to move bees out of the field prior to treatment, but bee losses due to drift must be



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minimized when relocating shelters. One should know exactly what he is doing and be sure that indeed, a treatment is required before using these chemicals, since the potential for devastating bee kills exists.

Literature Cited

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- Johansen, C.A. 1981. Involvement of bee poisoning in integrated pest management with special reference to alfalfa seed crops. In: Handbook of pest management in agriculture. CRC Press, Inc., Boca Raton, Florida. Vol. II 433-444.
- Johansen, C.A. 1979. Alfalfa seed insect pest management. WREP #12: 4-5.

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ALFALFA SEED PEST MANAGEMENT DATA SHEET

RESULTS OF SWEEP SAMPLES

(Five Sweeps Per Station)

Grower's Name JOHN DOE Date Sampled: 7/2/81

Area _____ Field #5 Time: 11:00

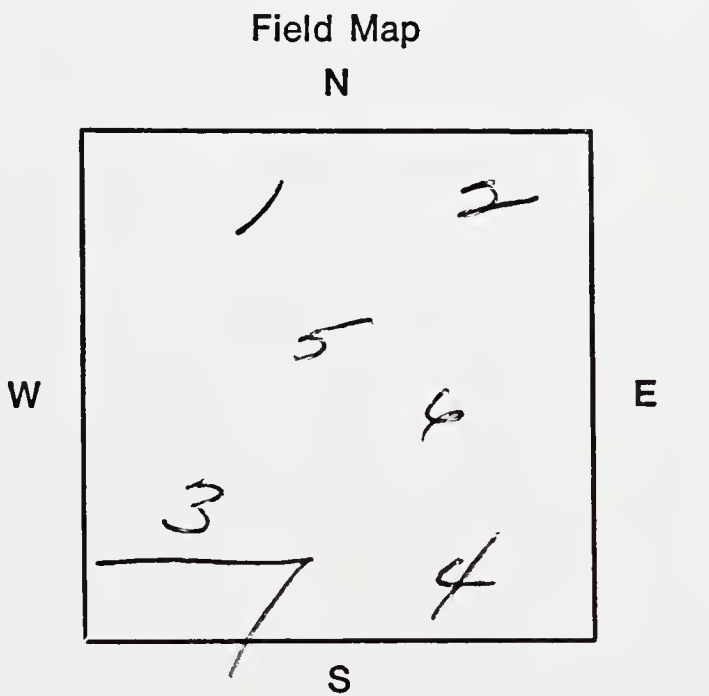
	Site #						Av/Sweep/Field
Pests	1	2	3	4	5	6	
Lygus adults	1	1		2	6		10 0.3
Lygus nymphs 1,2,3		3	10	16	25	5	59 1.9
Lygus nymphs 4,5	1	3	7	4	6	1	22 0.7
Pea aphids	150	150	200	500	325	400	1805 60.2
Alfalfa weevil adults							
Alfalfa weevil larvae/terminal							
Alfalfa looper larvae	1					1	2 0.07
Mites (%)							
Other: <u>grasshopper</u>						1	1 0.03

Beneficials							
Bigeyed bugs			2		1	2	5 0.2
Damsel bugs	1 ^W	3 ^W	2 ^A	1 ^W	2 ^W	2	15 0.5
Lady beetles	4 ^A				1 ^A	1 ^A	11 0.4
Lacewing larvae							
Other:							

Pollinators: Boards _____ Straws _____ Laminates _____ Beds _____

1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7 _____

Remarks: Harvey's, Leguminous Beans, Octave



A / B 3 C / D / E 2 F /

G / H 2 I / J / K 2 L

Pesticide applied _____

Date _____

↑
Code for weather, pollinators, crop stage etc.

